

Granule membranes play dice

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Cellular communication depends on membrane fusion mechanisms. SNARE proteins play a fundamental role in all intracellular fusion reactions associated with secretion of vesicles. We present Growth and Elimination (G&E), a Markovian birth & death model for the investigation of granule growth, its evoked and spontaneous secretion and their information content, based on a simple nano-machine of SNARE self-aggregation, which we interpret as a statistical mechanics - type particle system. The required number of SNARE aggregates (which varies between cell types) affects and is statistically identifiable from the size distributions of spontaneous and evoked secreted material. The talk will survey the speaker's work with Ilan Hammel (Faculty of Medicine, Tel Aviv University) and their student Eyal Nitzany on the subject.